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ABSTRACT

A project was conducted to develop, field test, and disseminate a series of 36 entrepreneurship modules for use with secondary vocational students. Seventy-eight occupations were evaluated as potential areas for module development. After a review by the United States Department of Education, a final set of 35 businesses was identified. Based on a literature review, staff compiled a list of basic skills considered important for small business owners to possess. Also surveyed were various formats and types of learning activities. Module content was limited to "Start-up skills" and skills that are critical to small business success. The modules were written, edited, and field-tested. A resource guide and a handbook on module utilization were also developed. Field test sites were selected and evaluation instruments were developed. A test with 30 multiple-choice items was constructed and administered as a pretest and a posttest to both treatment and control groups. An end-of-module questionnaire also elicited suggestions from teachers on how modules could be revised and ways in which they could be taught. Pre- and posttests were then scored and analyzed. Dissemination workshops were held and project staff delivered papers at meetings and conventions. (CT)

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FINAL TECHNICAL REPORT

DEVELOPMENT OF ENTREPRENEURSHIP TRAINING COMPONENTS FOR VOCATIONAL EDUCATION

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30 November 1981

Discrimination Prohibited - Title VI of the Civil Rights Act of 1964 states: "No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance." Therefore, the Vocational Education program, like all other programs or activities receiving financial assistance from the Department of Education, must be operated in compliance with this law.

The project presented herein was performed pursuant to Contract No. 300-79-0535 from the U.S. Department of Education, Office of Vocational and Adult Education. However, the opinions expressed herein do not necessarily reflect the position or policy of the U.S. Department of Education, and no official endorsement by the U.S. Department of Education should be inferred.

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The directors of the regional networks of the National Network for Curriculum Coordination in Vocational-Technical Education (NNCCVTE) were very cooperative in helping project staff to set up and conduct the dissemination workshops. The network directors provided excellent support for the workshops, which proved to be an effective vehicle for introducing the materials to potential users.

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Chapter I

PREPARATION OF MATERIALS

In seeking to fulfill its Congressional mandate to make vocational education more responsive to the world of work, the U.S. Department of Education's Office of Vocational and Adult Education contracted with the American Institutes for Research (AIR) to develop, field test, and disseminate a series of entrepreneurship training components (ETC) for use with secondary vocational students. The Department of Education conceived this effort to be a project of national significance in view of: (1) the major role that small businesses play in generating new employment opportunities in our economy; (2) the underrepresentation of women and minorities in the ranks of American small business owners; (3) the present high rate of small business failure; and (4) the scarcity of entrepreneurship training materials at the secondary level.

The major objectives of the project were to:

- Develop 36 instructional modules on entrepreneurship (one core module and 35 business-specific modules);
- Determine the effectiveness of the materials by field testing them at sites representing a wide range of possible users; and
- Create awareness of the materials' availability and encourage use of the modules in secondary-level vocational courses.

Description of the Materials and the Development Process

In developing the entrepreneurship training components, AIR staff began by reviewing existing entrepreneurship materials. They found many resources treating the general topic of entrepreneurship, several of which presented information in an instructional format and at a content level suitable for secondary students. Business-specific materials were also identified that

provided entrepreneurship information to adults already committed to starting a small business. However, no previously developed materials were available that met all the following educational specifications: (1) the materials were instructionally oriented; (2) they promoted career exploration in entrepreneurship at the secondary level; and (3) they treated entrepreneurship in the context of specific businesses related to occupations for which vocational students were training.

The AIR modules were developed to meet these conditions. More specifically, since the modules were designed for instructional purposes, they contain elements needed to guide student learning effectively--module goals and objectives, case studies, text, learning activities, and a module quiz. Responses to learning activities and the quiz are also provided. The modules focus on assisting secondary students in their career planning and decision making by providing an overview of the potential rewards and typical problems of small business ownership and of the personal qualities needed for success. They also present the basic knowledge and skills needed to start and operate a small business and provide opportunities to develop and apply this learning to simulated situations in specific businesses.

The set of 36 modules consists of a core module that teaches basic business knowledge and skills needed by all prospective small business owners, and 35 business-specific modules that apply basic entrepreneurship principles to various small businesses related to the seven major vocational disciplines in which secondary students are enrolled. The modules can be infused into existing vocational classes. They are self-contained, requiring no additional resources, and can be used by teachers with little or no background in small business ownership. They can be used in a group or individualized setting and require a limited amount of study time. The core

module requires a minimum of 16 hours to complete, while each business-specific module requires a minimum of 10 hours.

Major tasks in the materials development phase of the entrepreneurship project included (1) selection of the 35 businesses for which modules would be written; (2) determination of the basic module content; (3) selection of an appropriate format and instructional strategies for achieving module objectives; (4) writing and editing of the 36 modules; and (5) development of related resources (a Resource Guide and a Handbook on Utilization). In order to accomplish these tasks, a comprehensive literature review of existing entrepreneurship materials was conducted, a large amount of data on vocational enrollments and small business opportunities was collected and analyzed, and the advice of the project's review panel members and other experts was solicited.

Selection of the 35 Businesses to Be Treated in Modules

AIR staff sought to select 35 small businesses to serve as topics for the business-specific modules. These businesses were to span all seven of the major vocational disciplines taught in secondary schools. Seventy-eight occupations were evaluated as potential areas for module development, based on the following criteria: secondary student enrollments in related occupational programs; number of job opportunities (as an indicator of demand for the occupation's product or service); anticipated growth rate of the occupation; and amenability of the occupation to entrepreneurial initiatives. The analysis was submitted for review to U.S. Department of Education program specialists for the seven vocational disciplines, and a final set of 35 businesses was identified.

Since secondary vocational enrollments vary widely and certain occupations are more amenable to entrepreneurial initiatives than others, the 35

businesses selected were not distributed equally across the seven disciplines. For example, occupational programs in the service areas of distributive education and trades and industry have high secondary-level enrollments and offer many opportunities for entrepreneurial activities. Thus, a larger number of businesses related to these vocational areas were selected as topics for module development. On the other hand, secondary-level enrollments and opportunities for small business ownership in health and technical programs are significantly lower, so only a small number of businesses related to these areas were chosen.

The 35 businesses finally selected for module development are displayed in Figure 1's list of project products.

Determination of Module Content

Based on a literature review of a large number of general entrepreneurship materials, staff compiled a list of basic skills generally considered important for small business owners to possess. During this review, staff also surveyed the various formats and types of learning activities used to present entrepreneurship knowledge and skills. Key references used in the developmental phase of the project are described in the Resource Guide, which is listed in Appendix A of this report.

A content outline further detailing these skills was developed and reviewed by the project's review panel. Skills were subsequently revised. A prime goal of this process was to limit module content to the following kinds of skills:

- start-up skills that an entrepreneur needs to have at the beginning of a business venture;
- "life-or-death" skills that are critical to the successful operation of a small business;

Figure 1: List of AIR entrepreneurship training components

Vocational Discipline	Module Number and Title
General	Module 1 - Getting Down to Business: What's It All About?
Agriculture	Module 2 - Farm Equipment Repair
	Module 3 - Tree Service
	Module 4 - Garden Center
	Module 5 - Fertilizer and Pesticide Service
	Module 6 - Dairy Farming
Marketing and Distribution	Module 7 - Apparel Store
	Module 8 - Specialty Food Store
	Module 9 - Travel Agency
	Module 10 - Bicycle Store
	Module 11 - Flower and Plant Store
	Module 12 - Business and Personal Service
	Module 13 - Innkeeping
Health	Module 14 - Nursing Service
	Module 15 - Wheelchair Transportation Service
	Module 16 - Health Spa
Business and Office	Module 17 - Answering Service
	Module 18 - Secretarial Service
	Module 19 - Bookkeeping Service
	Module 20 - Software Design Company
	Module 21 - Word Processing Service
Occupational Home Economics	Module 22 - Restaurant Business
	Module 23 - Day Care Center
	Module 24 - Housecleaning Service
	Module 25 - Sewing Service
	Module 26 - Home Attendant Service
Technical	Module 27 - Guard Service
	Module 28 - Pest Control Service
	Module 29 - Energy Specialist Service
Trades and Industry	Module 30 - Hair Styling Shop
	Module 31 - Auto Repair Shop
	Module 32 - Welding Business
	Module 33 - Construction Electrician Business
	Module 34 - Carpentry Business
	Module 35 - Plumbing Business
	Module 36 - Air Conditioning and Heating Service

Related Resources: Resource Guide of Existing Entrepreneurship Materials
Handbook on Utilization of the Entrepreneurship Training Components
Module Completion Record Sheet

- skills that could easily be learned by secondary-level vocational students to increase the likelihood that they would be successful in their first encounter with entrepreneurship; and
- skills that could be linked together in a logical instructional sequence.

The final list contained eight essential entrepreneurship skill areas with 15 related skills. These became the basis for the 15 units that comprised the core module. For the business-specific modules, these same skills were treated in a total of nine units. A list of the skill areas appears in Figure 2.

Figure 2: Entrepreneurship skill areas treated in AIR's modules

1. Initial Planning (understanding responsibilities and personal qualities of entrepreneurs; doing market research and planning one's goods and services; understanding legal forms of business and other legal requirements; choosing a business location; and obtaining a business loan)
2. Personnel Management (focusing on job descriptions and hiring)
3. Daily Operations (focusing on work orders and work schedules)[1]
4. Purchasing and Inventory Management[1]
5. Pricing
6. Advertising and Selling
7. Financial Recordkeeping (keeping track of income; keeping track of expenses)
8. Business and Maintenance and Growth (monitoring cash flow;[2] evaluating profits and controlling costs; updating goods and services)

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[1] In business-specific modules, only one of these units is included—"Operations" for service-oriented businesses, or "Purchasing and Inventory Management" for product-oriented businesses.

[2] Included in core module only

Module goals and objectives were then developed. Objectives were aimed at helping students: (1) acquire information about what entrepreneurs must do and know to succeed; (2) develop basic skills relating to starting and managing a small business; and (3) develop an interest in entrepreneurship as a career option.

Selection of Format and Learning Activities

Decision rules regarding how content would be presented in the modules were derived from the following considerations:

1. Modules would provide introductory information about the career option of entrepreneurship and the skills essential for success.
2. Modules would provide students with experiences closely related to the real world of small business ownership.
3. Modules would be infused into existing vocational classes and would require a total of approximately 26 hours of class time (to study the core module and one business-specific module).
4. Modules would be designed for use in varied instructional settings.
5. Modules would be conveniently packaged, self-contained, printed materials. No additional educational resources would be required.
6. Modules could be easily used by vocational instructors with little or no background in entrepreneurship.
7. Modules would incorporate sound instructional techniques that promote learning.
   - They would be competency-based and would contain activities designed to help students achieve mastery of stated objectives.
   - Information would be presented clearly and attractively.
   - Performance tasks would be short and within students' ability to complete successfully.

- Student performance would be frequently measured and the results made available to students.
- Students would be given opportunities to work at their own rate in their own areas of interest and also to work together with their peers on group projects.

Based on the above guidelines and the review of other current materials, AIR staff developed the module format and selected appropriate types of learning activities. They decided that the student guide portion of each module would contain all the instructional content of the program and would be designed to be used extensively by teachers and students. Student guides would aimed at a sixth-grade reading level so that students could understand the information. At the same time, student guides would be sufficiently comprehensive in content that additional references or extensive teacher training would be unnecessary. Modules could thus be used in a variety of settings--for example, on an independent-study basis for a single student or as a guide for a teacher-centered classroom.

Student guides contain the following components:

1. Introduction
2. Instructional Units
   - Goal and objectives
   - Case study
   - Text
   - Learning activities
3. Summary
4. Quiz

Short teacher guides were also developed that suggested general teaching strategies and provided answers to the learning activities and module quiz. Teacher guides contain the following components:

1. Overview (of the Entrepreneurship Training Components)

2. Suggested Steps for Module Use

   - Introduction
   - Instructional Units
     - Case study (brief summary)
     - Text (topics covered)
     - Responses to learning activities
   - Summary
   - Quiz

3. Suggested Readings

4. Goals and Objectives

Learning activities presented in the student and teacher guides include individual and class readings; lectures; case studies; multiple-choice, short-answer, and matching questions testing recall of textual material; worksheets and business forms; class discussions; role playing; group projects; research problems involving use of local newspapers, the Yellow Pages, and maps; guest speakers; and interviews with local business owners.

Detailed responses to all learning activities are included in the teacher guides to permit immediate feedback to students, and an end-of-module quiz (with an answer key) is also provided.

Because of the variety of learning activities in the modules, teachers may use various instructional strategies--a large-group, traditional classroom approach; small-group situations; independent study; the contract method of instruction; and an incentives approach.

An attractive module format was developed that served as the basis for production of all 36 instructional units. Line drawings of entrepreneurs on the job were included in the modules to enhance student interest.

Writing and Editing of Modules

The 36 instructional modules were written by nine authors over a five-month period. Authors interviewed local entrepreneurs currently operating small businesses of the types targeted for description in the modules. Information gained from these interviews (personal experiences, guidelines on effective business management techniques, and financial information) served as the basis for the business-specific modules. However, case studies and other business examples presented in the modules are compilations or adaptations of information collected during the literature review as well as the business owner interviews.

All modules were edited for grammar, format, and general content by staff editors; field test versions of the modules were then prepared. Student guides for the business-specific modules were from 90-100 pages in length. The core module was 160 pages long. Teacher guides ranged from 30 to 50 pages.

Development of Related Resources

The Resource Guide of Existing Entrepreneurship Materials was prepared after completion of the literature review. This guide is a comprehensive listing of all materials collected during the literature search that were considered to be valuable sources of entrepreneurship information. Two hundred thirty-nine references are listed in the guide. The guide consists of five sections:

- Introduction
- Annotated References (descriptions of particularly valuable entrepreneurship materials, both individual documents and series)
- Additional References

- Institutions (names and addresses of organizations involved in entrepreneurship education)
- Index to Business-Specific References

The Handbook on Utilization of the Entrepreneurship Training Components for Vocational Education was developed to provide direction in use of the entrepreneurship materials. It addresses the following audiences: (1) persons considering use of the ETC materials; (2) persons who have acquired the materials and are preparing to incorporate them into their vocational classes; and (3) persons responsible for conducting inservice education programs regarding use of the ETC materials, including staff development for state and local vocational education supervisors as well as local classroom teachers. The handbook provides a brief background to the entrepreneurship training components and explains the advantages of the materials for administrators, teachers, and students. It provides guidelines for administrators on how to adopt the materials in their local settings and gives suggestions to teachers on instructional strategies for presenting course material. Guidelines are also provided to aid administrators in evaluating the use of the ETC materials in their districts.

Chapter II

FIELD TEST OF THE MATERIALS

The entrepreneurship student and teacher guides were field tested at selected secondary schools across the country during the 1980-81 school year. A quasi-experimental, pretest/posttest, treatment group/control group design was used to test the effectiveness of the entrepreneurship materials. The field test design featured multiple replications at sites across the country. Participating students were enrolled in various types of secondary vocational schools and programs and experienced various instructional arrangements and methods of teaching. The field test was conducted under a variety of conditions representing those in which the modules will actually be used.

Major project tasks related to the field test included (1) selection of field test sites; (2) development of evaluation instruments; (3) use of modules and evaluation instruments at the field test sites; and (4) analysis of field test data.

Results of the entrepreneurship field test indicated that study of the entrepreneurship core module and one appropriate business-specific module produced significant gains in students' knowledge of the skill areas necessary to start and operate a small business successfully.

Selection of Field Test Sites

Several criteria were used in selecting sites at which to field test the entrepreneurship modules. These criteria included: (1) the site's interest in implementing the entrepreneurship modules; (2) sufficient enrollment so that a number of business-specific modules could be tested at

each site; (3) willingness to meet evaluation design specifications; and (4) geographical location.

Nominations of potential sites were solicited from all 57 State Liaison Representatives of the National Network for Curriculum Coordination in Vocational-Technical Education. A total of 88 nominations was received. The nominated sites were contacted to inform them of their nomination and to discuss AIR's guidelines for participation in the field test. Requirements for participation were the following: (1) a coordinator be assigned responsibility for field test duties; (2) two modules (the core module and one business-specific module) be taught to approximately 18 students in each of several vocational classes; (3) a control group of about 18 students similar to the treatment students be selected; (4) the pretest/posttest be administered to treatment students before and after they studied the modules and to the control group at about the same times; and (5) an End-of-Module Questionnaire be completed by teachers for each module taught.

Twenty-four sites were selected to participate in the field test. These sites demonstrated their agreement and commitment to participate by completing a form indicating demographic characteristics of the site, a date for conducting on-site training regarding field test requirements, and the business-specific modules that could be taught at the site.

A local coordinator at each site identified instructors and students to serve in the treatment and control groups. A project staff member conducted a half-day orientation session at each site prior to the start of the field test. The orientation covered the value of entrepreneurship training for secondary vocational students, procedures for developing the entrepreneurship skills list and selecting the 35 businesses, a description of the module format, and an explanation of the evaluation design. Instructions

were given regarding pretest/posttest administration and the role of the local field test coordinator.

Certain field test sites that used the entrepreneurship modules were unable to return all required field test instruments and thus were eliminated from the data analysis. Reasons for elimination included scheduling problems, a teachers' strike, a school fire, and loss of completed field test materials in the mail. Only one site discontinued participation in the field test because of problems related to the materials themselves. This site, in rural Texas, had a large number of students with low reading levels and migrants. Students had difficulty reading the materials and identifying with entrepreneurship as a career option.

The 14 entrepreneurship field test sites determined to have fully implemented the field test procedures included high schools, regional vocational centers, and a secondary correctional school (see Figure 3). Five sites were located in the east, three in the south, and six in the west. There were four urban sites, six suburban sites, and four rural sites. The type of institution (e.g., comprehensive high school) was the same for both treatment and control groups at each site.

Figure 3 also shows the number of treatment group and control group students who participated in the field test at each site and the types of vocational courses in which they were enrolled. Since only one vocational class was identified as the control group for each site, students of one teacher at one school served as the control group for a particular site.

The modules were used in two types of vocational classes. They were used in regular vocational instruction in which students were learning technical skills. For example, students in auto mechanics worked on cars in the garage and worked on the entrepreneurship modules in the classroom. The

Figure 3

FIELD TEST SITES AND PARTICIPANTS

Name and Location of School District	Setting	Type of Institution(s)	# of Schools (Treatment Group)	# of Teachers (Treatment Group)	Related Vocational Discipline (Treatment Group)	Related Vocational Discipline (Control Group)	Number of students (T group)	(C group)
EAST								
1. State of Rhode Island	Urban	Regional Vocational Centers	2	6	Ag, DE, Home Ec, T&I	T&I	62	14
2. Gloucester County Area Vocational-Technical School, Sewell, NJ	Suburban	Regional Vocational Center	1	6	Ag, Health, Home Ec, T&I	T&I	106	18
3. Central Westmoreland County Area Vocational-Technical School, New Stanton, PA	Suburban	Regional Vocational Center	1	9	Ag, DE, Health, Home Ec, T&I	T&I	151	14
4. Baltimore County Public Schools, Towson, MD	Suburban	Comprehensive High Schools	10	12	Diversified Occupations	Diversified Occupations	282	15
5. Newaygo County Area Vocational Center, Fremont, MI	Rural	Regional Vocational Center	1	11	Ag, Bus & Off, Home Ec, T&I	Bus & Office	157	35
SOUTH								
6. Central High School, Little Rock, AR	Urban	Comprehensive High School	1	12	DE, Health, Bus & Off, Home Ec, Industrial Coop. Training (ICT)	DE	147	14
7. Kirbyville Consolidated Independent School District, Kirbyville, TX	Rural	Comprehensive High School	1	5	DE, Home Ec, T&I	Bus & Office	79	12
8. Austin Independent School District, Austin, TX	Urban	Comprehensive High Schools	7	11	DE, T&I, ICT	ICT	164	20
WEST								
9. North Dakota Industrial School, Mandan, ND	Rural	Juvenile Correctional Facility	1	5	Ag, Bus & Off, Home Ec, T&I	Bus & Off	19	18
10. Granite School District, Salt Lake City, UT	Urban	Comprehensive High Schools	5	8	DE, Bus & Off, Home Ec	DE	103	7
11. Weber County School District, Ogden, UT	Suburban	Comprehensive High School	1	2	DE	Bus & Off	23	16
12. Highline School District, Seattle, WA	Suburban	Comprehensive High Schools	2	2	DE	DE	33	16
13. Issaquah School District, Issaquah, WA	Rural	Comprehensive High School	1	1	Diversified Occupations	Home Ec	34	15
14. Sequoia High School District, Redwood City, CA	Suburban	Comprehensive High School	1	2	Bus & Off	Bus & Off	9	17
						TOTAL	1369	231 = 1600

materials were also used in cooperative education (coop) classes. Coop students studied the entrepreneurship modules as part of their on-campus curriculum and also worked part-time in paid employment. Class sizes varied at all sites, depending on the type of vocational class. Class sizes ranged from under 10 to over 30 students.

Both treatment and control groups had approximately equal proportions of males and females. Students' ages ranged from 14 to 19 years. The means of the ages of treatment group and control group students were 16.8 years and 16.7 years, respectively.

Development of Evaluation Instruments

Pre/Posttests

Since no standardized test existed to adequately estimate the effectiveness of the entrepreneurship modules, a test with 30 multiple-choice items was constructed specifically for use in the field test. The test provides information on the overall effect of studying the core module and one business-specific module. It assesses knowledge of the skills that were identified by project staff as essential for success as a beginning entrepreneur and that served as the basis for developing the module goals and objectives. The same instrument was administered as a pretest and a posttest to both treatment and control groups.

The pretest/posttest was prepared according to a careful, step-by-step development process and was approved by the Federal Education Data Acquisition Council (FEDAC), the group charged with ensuring that data are collected by the most efficient and effective means. Forty-three four-option, multiple-choice items were written to test knowledge of skills presented in each unit of the core module. The module's author identified areas to be

tested, and the items were written and reviewed for content validity by project staff. The project's evaluation director also reviewed the items for technical adequacy. Then the items were revised as many times as were necessary.

A total of 18 secondary vocational students who were participating in one of two training programs (construction and word processing) at a regional vocational center comprised the group that pilot tested the test items. Items were divided into two sets, and four or five students from each course answered each set. Pilot test students were also given an opportunity to critique the items. No comments indicating necessary revisions were received.

Using pilot test results, discrimination indices (point-biserial correlations) and difficulty levels were calculated for each item. Items with low discrimination indices or very high or low difficulty levels were removed from the item set to be included in the pretest/posttest until the final version contained two items directly related to content in each of the 15 units of the core module.

Validity. Because of the direct correspondence of test items to module content, the entrepreneurship pretest/posttest was judged to be a valid indicator of the effectiveness of the modules.

Reliability. A Spearman-Brown split-half estimate of the reliability of the entrepreneurship pretest/posttest was calculated using the pretest data of 85 treatment group students and 15 control group students chosen randomly from all those who participated in the field test. An estimated reliability coefficient of .69 was obtained, which is relatively high for a 30-item test and certainly sufficient for making comparisons between groups, as was done in the entrepreneurship field test.

End-of-Module Questionnaires

Another evaluation instrument that was developed to provide information about the degree of implementation of modules and the perceived value of materials was the End-of-Module Questionnaire. On this instrument teachers were asked to indicate the number of hours required for teacher preparation, class teaching time, and homework for each module. They also were asked to provide a group rating (by students and teacher) of the modules on a variety of five-point scales relating to interest of materials, clarity, ease of use, and general value to students.

The End-of-Module Questionnaire also elicited suggestions from teachers on how modules could be revised and ways in which the modules could be taught. The information collected from the EMQs was to be used to provide descriptive information about the field test experiences of each site and to aid in module revision.

Use of Materials at Field Test Sites

At all sites, the entrepreneurship modules were taught by regularly-employed vocational instructors. Students who participated in the field test completed the entrepreneurship modules as part of their regular course-work. Generally, modules were taught by teachers during class time, although some students used the modules on an independent study basis. In most cases, the core module and one particular business-specific module were studied by the whole class, but in some classes students selected different business-specific modules for study after completion of the core module. This was the case particularly in coop classes, in which students selected a module related to their job placement.

Since methods for infusing the modules into course work and for teaching their content were not prescribed during the orientation sessions, instructors taught the modules in a variety of ways. Some teachers used a lecture method, basing class presentations on the case study and text sections. Other teachers displayed portions of the student guide on an overhead projector for total-class or small-group discussions. Instructors selected the learning activities most appropriate for their students and relevant to their local settings. Some instructors developed intermediate quizzes to supplement the final quiz contained in the module.

Treatment group students were exposed to the following: the pretest, the core module, one business-specific module, and the posttest. Control students took a pretest and a posttest. During the interim, control students received their regular vocational instruction--i.e., technical skills training or the cooperative education curriculum, depending on the type of class in which they were enrolled. Pretests and posttests were administered to the treatment and control groups at any one site at approximately the same times. Across sites, the pretest was given during the fall and winter of 1980, while the posttest was administered during the winter and spring of 1981.

Analysis of Field Test Data

Upon completion of the field test and receipt of evaluation instruments, AIR staff identified the sites and students that had fully implemented materials and scored and analyzed pre/posttests for these groups. Only students who had completed a pre- and posttest and had studied the core module and one business-specific module were included in the data analysis.

An attempt was made to ensure that scoring and analysis was done objectively and reliably. While the pretests and posttests were administered by the teachers of treatment and control students in their classrooms, the completed tests were sent directly to AIR for scoring. Tests were scored and data were coded and keytaped by clerical staff who had little stake in the outcome of the field test. Considerable effort was spent on checking coding and keytaping to eliminate clerical errors. Computer services staff of AIR, rather than project staff, analyzed the data using standard statistical packages.

Evidence of Impact

The effect claimed for the entrepreneurship modules is based on the results obtained from administering the pretest/posttest comprised of multiple-choice items. The assertion of the effectiveness of the modules is based on the comparison of the pretest and posttest results of students who studied the modules and the comparison of these data with results obtained from an equivalent control group who did not study the modules. The test results of only those students who took both a pretest and a posttest (and for the treatment group, students who studied the two-module sequence) were included in the analyses.

T-tests for independent samples were used to compare pretest and posttest results of treatment and control group students. T-tests for correlated samples compared pretest with posttest results for both groups. The results of these analyses are shown in Table 1. While the mean test scores of both groups increased significantly from the pretest to the posttest, the treatment group's gain in mean score from the pretest to the posttest was greater than the gain of the control group. The difference between the mean

scores of the treatment group and the control group on the pretest was not significant, while the difference between their posttest scores was significant at the .01 level.

Table 1

ENTREPRENEURSHIP FIELD TEST PRETEST AND POSTTEST RESULTS

	Status	N	Mean	Standard Deviation
Pretest Scores	Treatment Group	1369	17.26	4.13
	Control Group	231	17.53	4.00
Posttest Scores	Treatment Group	1369	19.96	4.82
	Control Group	231	18.91	4.65

T-Test Analyses

Comparison	T	Probability
Treatment Group Pretest vs. Treatment Group Posttest	25.41	<.0001
Treatment Group Posttest vs. Control Group Posttest	-3.08	<.01
Control Group Pretest vs. Control Group Posttest	5.38	<.0001
Treatment Group Pretest vs. Control Group Pretest	0.91	>.36

To provide another perspective on the T-test results, an analysis of covariance (general linear models procedure) was run with the pretest score as the covariate and the posttest score as the dependent variable. The difference in mean posttest scores was significant at the .0001 level.

Statistical Reliability and Generalizability of Results

Students selected to participate in the field test were broadly representative of the intended users of the entrepreneurship modules—secondary vocational students. The site selection process utilized by project staff resulted in a diverse sample that varied along the dimensions of geographical location, demographic setting, and institutional type. Field test data

were collected at 14 sites across the country that represented the range of educational settings in which intended module users receive instruction. Modules were infused into vocational classes and curricula in a variety of ways at the discretion of the instructors. Treatment student gains were consistent across the 14 sites.

Since the modules were tested on such a representative group of individuals, the results of the field test should be generalizable to the entire target population. Because the field test was conducted under natural conditions representing the wide variety of conditions for which the modules were designed, it is likely that the results reported are not limited to the field test.

Evidence That Effects Are Attributable to the Intervention

Treatment and control group students who provided data for the comparisons reported earlier were quite similar.

Control groups were selected with the stipulation that they be made up of persons essentially similar to the treatment students. Following is the instruction given to local site coordinators: "Members of both the experimental group and the control group should be generally representative of the modules' intended audience (students enrolled in vocational courses), and the groups should be basically alike in age, background, ability, and education." Treatment and control students at each site attended the same type of institution. In 13 of the 14 sites, treatment and control students attended the same type of classes (technical skills training or cooperative education).

Data collected during the field test reinforce the assertion that the treatment and control groups were drawn from the same population. The means

of the ages of individuals in the two groups differed by only about 1½ months. A difference of this size is unlikely to have had any effect on field test results. The percentages of representatives of the two sexes did not differ significantly between the two groups ($p = .2$ by chi square). And finally, the means of the pretest scores of students in the two groups did not differ significantly.

Practice effects, maturation, and intervening external influences are not likely to account for the statistically significant difference in the two groups' posttest scores, either. At each site, treatment and control groups were tested at about the same times. The effects, if any, of potentially biasing factors would be the same for each group of students. These factors could not bias field test results in favor of module effectiveness.

Positive Responses of Field Test Instructors

Entrepreneurship instruction is an area of high current interest to vocational instructors, as demonstrated by the fact that all field test sites participated in the project on a voluntary basis. Furthermore, teachers who used the modules in their classrooms reported on a questionnaire that they considered the modules to be generally valuable and easy to use and that they would recommend using the modules to other teachers. The final bit of evidence supporting the effectiveness and usability of the entrepreneurship modules is the fact that all but one of the field test sites planned to continue use of the modules in the 1981-82 school year.

Chapter III

DISSEMINATION

The major efforts at introducing vocational educators to the entrepreneurship training components consisted of six regional dissemination workshops for state-level educators and three technical assistance workshops for teachers. In addition, project staff delivered papers at numerous vocational education meetings and conventions and wrote several journal articles describing the project. A publisher was also identified for continued distribution of the entrepreneurship training components after completion of the project.

Dissemination Workshops

Six entrepreneurship dissemination workshops were held in June and July 1981. The purposes of the workshops were four-fold: (1) to orient the participants to the varied potential uses of the entrepreneurship materials; (2) to allow the participants a full opportunity to examine the materials; (3) to obtain participants' reactions to the materials; and (4) to encourage the participants to prepare a plan for disseminating the entrepreneurship materials in their respective states.

Over 200 vocational educators from 53 states and territories attended the workshops, which were held in the following locations: Los Alamitos, California; Oklahoma City, Oklahoma; Atlanta, Georgia; Newton, Massachusetts; Columbus, Ohio; and Salt Lake City, Utah. The directors of the regional networks of the National Network for Curriculum Coordination in Vocational-Technical Education (NNCCVTE) assisted entrepreneurship project staff in setting up the workshops, and officials at the National Center for Research

in Vocational Education helped to make arrangements for the Ohio workshop, which was held at the Center.

Orientation of Workshop Participants

The dissemination workshops were held in conjunction with another AIR project of national significance, the VECS Field Test. The first day of the workshop was devoted to presentation of the VECS modules. On the second day, the entrepreneurship project director explained to workshop participants the need for entrepreneurship training for secondary vocational students and gave a brief summary of the history and purposes of the project.

Presentation of the Materials.

The project director then presented the entrepreneurship training components to workshop participants through the following activities.

Description of key entrepreneurship skills and introduction of ETC materials. The project director described the eight key skill areas and their 15 related skills that form the basis of the module content and explained the instructional format of the modules. When appropriate, she introduced individuals in attendance at the workshop who had had direct experience in using the modules in the field test. These people spoke from their own experience about strengths and weaknesses of the materials and how they can be used in various settings.

Small group examination of and discussion regarding the materials. Workshop participants were divided into small groups of five to seven members. Each group was given a number of modules from each vocational discipline and instructed to spend approximately one hour exploring the materials. The members of each group designated one person to write down both

strengths and concerns about the materials that emerged from the group study and discussion process. To encourage open discussion among the members, the project director did not participate in any of these small group sessions.

Question/answer session. Following the small group sessions, the workshop participants met once again in a large group. The project director solicited summaries of the strengths and inadequacies of the materials that had emerged in each of the group sessions and recorded them either on a chalkboard or on a large newsprint pad. Then the project director proceeded to respond to the items. Dialogue that ensued between her and workshop attendees helped to clarify the responses. In general, the input from the participants was incisive and thought-provoking.

Development of State Dissemination Plans

Workshop participants were also given time to develop plans for disseminating the entrepreneurship materials in their respective states. Preliminary plans were submitted to the AIR project director by each of the teams of state representatives. In most instances, a variety of creative strategies were included in the plans. The project director invited representatives from each state-level dissemination team to attend follow-up meetings at the AVA Convention in December 1981 (after an interim of six months) and at the July 1982 Concurrent Meeting of the NNCCVTE (one year after the workshops). The purposes of planning such meetings are to increase the likelihood that workshop participants will implement their state-level dissemination plans and to determine the effectiveness of dissemination strategies conducted in the various states.

Reactions of Participants

The modules were very well received by the vocational educators attending the workshops and were viewed as having a much broader target audience than merely secondary students. Participants emphasized that the modules provide a broad awareness of entrepreneurship as a career option and that they could be used in pre-vocational exploratory classes as well as in post-secondary settings.

Use of the Materials

To date, the following reports have been received from various states regarding their plans to implement the entrepreneurship training components.

Florida. An associate at Florida State University's Center for the Study of Vocational Education is planning to use the entrepreneurship modules with 70-140 teachers in a study of the adoption of vocational education materials. In addition, Center staff plan to make Module 1, the core module, available to every vocational educator in the state (about 20,000 people). They have arranged an initial printing of 5,000 copies of Module 1, the Resource Guide, and the Handbook on Utilization as well as 100 copies of each of the business-specific modules.

New Jersey. One of the Northeast Dissemination Workshop attendees is adapting the agriculture modules for use in a college-level farm management course he is teaching.

New York. The Director of Vocational Education for the Buffalo City School District scheduled a September meeting to present the entrepreneurship modules to the Buffalo teachers.

California. Los Angeles County has conducted four workshops for business education teachers on use of the entrepreneurship materials. Staff

have distributed 150 copies of Module 1, 100 copies of Modules 7-13, and 100 copies of Modules 17-21. Current efforts include working with the consumer and homemaking consultant and the industrial education consultant to arrange distribution of Modules 22-26 and 27-36 to teachers in their respective disciplines.

Technical Assistance Workshops

Three technical assistance workshops were held in August and September 1981. The purpose of the workshops was to meet with state and/or local vocational education administrators as a follow-up in implementing plans to carry out the dissemination workshops' goals and objectives within individual states.

Approximately 400 vocational educators attended the workshops, which were held in Albuquerque, New Mexico; Bismarck, North Dakota; and Phoenix, Arizona. In each case the request for technical assistance was a direct result of the dissemination workshops held in June and July 1981, since the state-level person who contacted the AIR project director had either attended a workshop or had discussed the project and its materials with someone who had attended one.

Overview of the Workshop Presentations

The project director typically began the session with a one-hour introductory presentation. If additional time was available, participants looked at the modules and asked questions stimulated by their materials review. The project director set a context for the relevance of entrepreneurship training by stressing that vocational students are already learning a technical skill that they could use to run a business. The importance of entre-

preneurship as a career option for students in rural settings was discussed. The history and purpose of the project were briefly summarized. The project director described the eight key entrepreneurship skill areas that form the basis of the module content and the procedures by which the field test was conducted. The project director closed the session with information regarding how teachers could obtain copies of the modules for use in their classes.

Individual Technical Assistance Activities

Following is a summary of each of the three technical assistance workshops.

New Mexico. A technical assistance workshop was conducted in Albuquerque in conjunction with the New Mexico Vocational Association Annual Conference. Three presentations were made to the following groups: (1) 80-100 industrial arts and T&I instructors; (2) 25 distributive education teachers; and (3) 150 persons attending a New Mexico Vocational Home Economics Teachers Association luncheon. Plans for module utilization include placing the modules in two mobile units operated under the auspices of the Vocational Information and Program Services (VIPS) project. The VIPS project is designed to provide all rural secondary and postsecondary vocational programs with supplementary materials and resources. The two VIPS vans serve all of New Mexico's school districts except two, which are in urban areas where teachers have access to resource centers.

North Dakota. A technical assistance workshop was conducted in Bismarck in conjunction with the North Dakota Vocational Association Annual Conference. Two presentations were made, with approximately 50 attendees each, as part of six concurrent special interest sessions. Plans for module utilization include placing the modules in the North Dakota Vocational Curriculum Lab located at Bismarck Junior College.

Arizona. A technical assistance workshop was conducted in Phoenix, with a half-day session for teacher educators and the other half-day session for state department staff and local vocational directors. Arizona's Research Coordinating Unit (RCU) funded the printing of 50 copies of Module 1 and 15-20 copies of the business-specific modules. Each person who attended the technical assistance sessions received a copy of Module 1 and business-specific modules for the discipline(s) in his or her area of supervision. During the technical assistance sessions arrangements were made for various attendees to obtain the RCU's complete set of modules so that further duplication could be done. Additional plans for module utilization include an inservice session for secondary teachers.

Convention Papers and Journal Articles

During the course of the project AIR staff delivered papers on the subject of entrepreneurship at meetings of the American Vocational Association, American Personnel and Guidance Association, California Personnel and Guidance Association, and Research on Women and Education. In addition, the project director and assistant director served as guest editors for a Journal of Career Education special issue on entrepreneurship, to which project staff also contributed three articles. A full list of convention papers and journal articles prepared appears in Appendix A.

Publishing Arrangements

An agreement was made with the Wisconsin Vocational Studies Center to print and distribute the entrepreneurship training components on a cost-recovery basis. Individual modules, as well as the entire 36-module set, can be ordered. The price for student guides will be approximately $6 and

for teacher guides $3 each. The discounted price for the entire set is $200. Materials can be ordered directly from:

Roger Lambert
Wisconsin Vocational Studies Center
964 Educational Sciences Building
Madison, Wisconsin 53706

Chapter IV

RECOMMENDATIONS FOR FUTURE ACTIVITIES

The entrepreneurship training components developed and field tested by the American Institutes for Research represent a unique effort at presenting the career of small business ownership to secondary vocational students. By and large, this career option has not been presented in vocational programs. Materials for secondary students that focus on small business ownership are quite scarce, and those that are available teach only general business management skills. The AIR entrepreneurship modules can be used easily by vocational teachers in a variety of instructional settings and arrangements. In addition, they apply general principles of small business ownership to selected occupations in which students have already expressed an interest by enrolling in particular vocational training programs.

These products constitute a milestone along one avenue for making education responsive to students' needs as well as to national goals. Entrepreneurship education can contribute to self-actualization as well as to our national goal of economic rejuvenation. Entrepreneurs who can contribute to the health of our economy by running ventures that are successes rather than economic and emotional disasters are needed. Entrepreneurship education is more than merely learning business management skills. It provides students with career exploration opportunities, and it promises to revitalize our economy by training job-providers.

In talking with vocational educators across the country, AIR staff have determined that there are two major areas in which future study related to entrepreneurship would be productive. These two areas are new materials

development and technical assistance to vocational educators to promote entrepreneurship training.

New Materials Development

AIR recommends that OVAE sponsor the development of a monograph describing how to generate new modules by using the AIR module content outline as a framework and developing the content on the basis of input from local advisory committees. A common refrain during the dissemination workshops was, "How can we develop more modules for businesses that are particularly relevant for our own setting?" There are many businesses outside the domain of the 35 we selected for which modules could be developed. Some of these businesses are restricted to certain geographical areas. For example, a common entrepreneurial initiative in Alaska is commercial fishing, for which AIR did not develop a module.

A second recommendation regards adaptation of the AIR materials for various target audiences.

Native Americans. AIR recommends that OVAE sponsor the adaptation of the 36-module entrepreneurship training series for use in tribal vocational education. Recent ED procurements have focused on strategies for linking vocational education programs to tribal economic development. Since many tribal nations are located in rural areas, it may be difficult to find job placements for students who have received vocational training. Having vocational program completers start their own businesses and hire other trainees to work for them may enhance achievement of the goals of tribal economic development plans.

Refugees. AIR recommends that OVAE sponsor a study to investigate the feasibility of providing refugees with entrepreneurship training. Our country's population is increasing daily due to refugee immigration. Refugee

intake centers assess clients' vocational interests, competencies, and aptitudes. Counselors at the centers find that a number of these people are technically skilled and would probably respond to entrepreneurship training.

Other ethnic minorities. AIR recommends that OVAE sponsor an effort to obtain support from the Department of Commerce and foundations to adapt the AIR training series for use with minorities. The ethnic group segment of the United States population especially needs entrepreneurship skills. While ethnic groups make up 17% of the total population, individuals within such minority groups own only 4% of the businesses in the country. It is not likely that this ratio will change without increasing the business training provided to help minority entrepreneurs overcome the basic problems that cause most business failures. This is a major concern of the U.S. Department of Commerce's Minority Business Development Agency.

Congress recently heard testimony that racism is a major cause of the staggering rates of unemployment among black and Hispanic youth. Agencies such as the Rockefeller Foundation have advocated aid to minority businesses with the rationale that the more minorities there are who start their own businesses, the more minorities there will be who are employed. One of the recommendations from our dissemination workshops was that materials be developed that focus more attention on barriers facing minority persons.

Females. AIR recommends that OVAE sponsor the adaptation of the entrepreneurship training components to develop a one-semester entrepreneurship training course for women. Available statistics indicate that only 4.6% of the nation's small businesses are women-owned. Why are there so few female entrepreneurs? One reason is the persistent institutional and attitudinal barriers that prevent women from obtaining necessary credit and financing. But the lack of adequate credit and financing is only a partial answer.

Women have been inadequately prepared, in terms of both knowledge and psychological attitudes, to enter the male-dominated world of entrepreneurship.

Computer adaptations. AIR recommends that OVAE sponsor the development of software so students can access the entrepreneurship modules through computers. As any one reading this report is aware, computer literacy is becoming a more and more prevalent characteristic of our country's population. Computer terminals are becoming more visible in our nation's classrooms.

Technical Assistance

AIR recommends that OVAE sponsor a concerted technical assistance effort to encourage implementation of entrepreneurship education as an integral part of vocational education. A major challenge is to help instructors of both pre- and inservice programs realize the importance of entrepreneurship education. Even though students may become small business owners long after graduation from high school, they will benefit from early participation in learning activities designed to open their eyes to the opportunities and challenges of entrepreneurship. Such a technical assistance effort would reach many levels.

- First, we recommend that OVAE sponsor more dissemination workshops to promote use of the AIR modules. The technical assistance workshops held during this contract's duration were effective mechanisms for informing administrators, teacher educators, and teachers about the materials as well as methods of using them in various instructional settings. The workshops could start with key states that have already expressed an active interest in entrepreneurship training.

- Second, we recommend that OVAE sponsor the provision of technical assistance to state-level administrators to help them plan for the provision of entrepreneurship education, which has been authorized as an approved activity for the expenditure of vocational education monies. This will be especially important if vocational education funds are distributed as a block grant to states. One aspect of such planning could be discussing how to organize school-based

corporations with the involvement of the local business community.

- Third, since it is expensive for SEAs and LEAs to pay consulting fees and travel expenses to bring in motivational speakers, we recommend that OVAE sponsor the development of a videotape that could be used to introduce inservice sessions for teachers who are learning how to implement entrepreneurship in their vocational courses. The videotape could focus on the value of entrepreneurship training for secondary vocational students.

- Fourth, we recommend inservice training for the OVAE program specialists to make them aware of how the entrepreneurship modules can be infused into various types of vocational program offerings.

Further Research

We suggest that OVAE sponsor a longitudinal follow-up study of students who have been exposed to the entrepreneurship training components. The study would be structured to answer two questions: (1) how many of these students have started their own small businesses? (2) for those who have started their own businesses, how does their success/failure rate compare with current statistics (80% failure rate over a five-year period)? Only by conducting such a study will we have a reading on the bottom-line benefits of this type of training.

APPENDIX A

List of Materials Produced Under Contract 300-79-0535

Modules

Number and Title	Author
1 - Getting Down to Business: What's It All About?	Carolyn McFarlane
2 - Farm Equipment Repair	Susan McBain
3 - Tree Service	Norma Shapiro
4 - Garden Center	Susan McBain
5 - Fertilizer and Pesticide Service	Susan McBain
6 - Dairy Farming	Susan McBain
7 - Apparel Store	Rachel Rassen
8 - Specialty Food Store	Rachel Rassen
9 - Travel Agency	Rachel Rassen
10 - Bicycle Store	Barbara Sanderson
11 - Flower and Plant Store	Rachel Rassen
12 - Business and Personal Service	Rachel Rassen
13 - Innkeeping	Rachel Rassen
14 - Nursing Service	Jean Wolman
15 - Wheelchair Transportation Service	Jean Wolman
16 - Health Spa	Jean Wolman
17 - Answering Service	Norma Shapiro
18 - Secretarial Service	Norma Shapiro
19 - Bookkeeping Service	Norma Shapiro
20 - Software Design Company	Norma Shapiro
21 - Word Processing Service	Norma Shapiro
22 - Restaurant Business	Marcella Kingi

23 - Day Care Center	Marcella Kingi
24 - Housecleaning Service	Carolyn McFarlane
25 - Sewing Service	Marcella Kingi
26 - Home Attendant Service	Barbara Sanderson
27 - Guard Service	Pamela Colby
28 - Pest Control Service	Pamela Colby
29 - Energy Specialist Service	Pamela Colby
30 - Hair Styling Shop	Joy Gall
31 - Auto Repair Shop	Carolyn McFarlane
32 - Welding Business	Joy Gall
33 - Construction Electrician Business	Joy Gall
34 - Carpentry Business	Joy Gall
35 - Plumbing Business	Barbara Sanderson
36 - Air Conditioning and Heating Service	Barbara Sanderson

Related Resources

Title	Authors
Resource Guide of Existing Entrepreneurship Materials	Carolyn McFarlane Pamela Colby
Handbook on Utilization of the Entrepreneurship Training Components	Pamela Colby Rachel Rassen

Convention Papers

Title	Convention/Date	Author(s)
Entrepreneurship in the 80s	American Vocational Association, Dec. 1980	Carol Kaplan
Entrepreneurship: Exploration and Preparation	American Vocational Association, Dec. 1980	Carol Kaplan Richard Bortz

The Value of Entrepreneurship Training for Secondary Vocational Students	American Personnel and Guidance Association, April 1980.	Carol Kaplan Richard Bortz
Training Women for Entrepreneurship	Research on Women and Education, Dec. 1980 and California Personnel and Guidance Association, Feb. 1981	Joan Druckman Rachel Rassen Carol Kaplan

Journal Articles

Title	Journal/Date	Author(s)
A Special Issue on Entrepreneurship Education	Journal of Career Education, Dec. 1981	Carol Kaplan Carolyn McFarlane (Guest editors of entire issue)
A National Field Test of Entrepreneurship Training Components	Journal of Career Education, Dec. 1981	Carol Kaplan Richard Bortz
Stimulating Entrepreneurship Awareness in High School Students	Journal of Career Education, Dec. 1981	Carolyn McFarlane
Entrepreurs for a New Age	Journal of Career Education, Dec. 1981	Jack Hamilton

Technical Reports

Title	Date	Author(s)
Written Summary of Workshop Accomplishments (1)	9/81	Carol Kaplan
Summary of Field Test Data (2)	9/81	Carol Kaplan
Synthesis of Field Test Findings (3)	9/81	Carol Kaplan
Summary of Consultations with Vocational Administrators (4)	9/81	Carol Kaplan
Report to the Joint Dissemination Review Panel	9/81	Carolyn Claudy Carol Kaplan Carolyn McFarlane

Final Technical Reports

Title	Date	Authors
Development of Entrepreneurship Training Components for Vocational Education (37 pages)	11/81	Carol Kaplan Carolyn McFarlane
Summary Report (10 pages)	11/81	Carol Kaplan Carolyn McFarlane
Executive Abstract (1 page)	11/81	Carol Kaplan Carolyn McFarlane